BY ORDER OF THE COMMANDER
51ST FIGHTER WING

51ST FIGHTER WING INSTRUCTION
21-106

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Maintenance

CRASH DAMAGED DISABLED AIRCRAFT RECOVERY (CDDAR) PROGRAM

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This instruction implements Air Force Policy Directive (AFPD) 21-1, *Maintenance of Military Materiel.* It establishes policy and procedures to support Crash, Damaged or Disabled Aircraft Recovery (CDDAR) operations and implements. In situations where the crash recovery team chief determines this instruction does not adequately cover procedures for the particular situation, authority is granted to add to or deviate from the procedures when safety of personnel or damage to equipment is involved. It applies to all personnel and units assigned, attached or tenant to the 51st Fighter Wing (51 FW) at Osan Air Base (AB), Korea. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the AF Form 847, *Recommendation for Change of Publication*; route AF Forms 847 from the field through the appropriate functional chain of command. Ensure that all records created as a result of processes prescribed in this publication are maintained IAW Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of IAW the Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS). The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force.

SUMMARY OF CHANGES

This document has been substantially revised and must be completely reviewed. This change updates roles and responsibilities for mishap response procedures, readiness and training, references to other AFIs and Technical Orders, and office symbols/duty titles.

1. General.

1.1. In-flight or ground emergencies involving aircraft require prompt, coordinated actions from many agencies to prevent unnecessary loss of life, damage to equipment or interference with other flying operations. This instruction is not intended to replace detailed guidance given by technical orders, other instructions or regulations, but rather to serve as a coordination tool to ensure all agencies are aware of their responsibilities during aircraft emergency situations.

1.2. Only required vehicles and personnel will respond to aircraft emergencies (with Ultra High Frequency (UHF) radios if available). Vehicles will position themselves behind responding crash vehicles and not impede movement or vision. Personnel not required to respond will clear the area so as not to interfere with emergency operations. If necessary, the Incident Commander (IC) will direct the Security Forces to clear the area of non-essential personnel.

1.3. During initial response to an aircraft emergency, the Senior Fire Officer (SFO) is the IC and will determine if the aircraft is safe prior to releasing the aircraft for maintenance or recovery. Until the aircraft has been released by the IC, no one will approach the aircraft without permission from the IC. All vehicles, except Fire Emergency Services, will remain clear of the aircraft. This does not prohibit essential vehicles (such as tugs) from positioning themselves nearby for immediate use. The IC must release the aircraft or direct specific actions before any vehicles, other than a Fire Emergency Services Vehicle, approach the aircraft. This restriction does not prevent emergency actions prior to Fire Emergency Services arrival.

1.4. For emergencies involving a prior-announced barrier engagement, all response vehicles (except Fire Emergency Services and crash recovery vehicles) and non-essential vehicles will remain clear of emergency aircraft until Fire Emergency Services and crash recovery actions are complete.

1.5. The 51st Maintenance Squadron (51 MXS) CDDAR Team Chief will coordinate with Wing Plans and Readiness office to perform crash recovery exercises as required for currency/proficiency purposes.

1.6. Rapid removal of aircraft on a runway or taxiway. During normal flying periods, disabled aircraft will be removed as quickly and safely as possible after touchdown. Damaged aircraft will be removed as soon as possible depending on structure condition, equipment requirements, etc. Damaged aircraft will be removed from the runway in a minimum time period consistent with the following:

1.6.1. Requirement to open the runway for operational use.

1.6.2. Prevention of unnecessary secondary damage.

1.6.3. Prevention of destruction of evidence for accident investigation.

1.6.4. Personnel safety.

1.7. For mishaps involving Air Mobility Command (AMC) or AMC contracted aircraft; the 51 MXS CDDAR Team Chief will coordinate with the 731st Air Mobility Squadron (731 AMS), to determine the best course of action. The 731 AMS Director of Operations (DO), in turn, will coordinate assistance through 51st Fighter Wing Command Post. 51 FW

Command Post will contact 618 AOC/XOCL for further assistance if indigenous recovery capabilities are exceeded. For AMC-contracted aircraft, 51 FW Command Post will contact the carrier representative directly or through USTRANSCOM/TCAQ via 618 AOC and request/obtain guidance/authority to move the disabled aircraft.

1.8. For mishaps involving 5th Reconnaissance Squadron (U-2) aircraft, the 51 MXS CDDAR Team Chief will coordinate with the 5 RS (U-2) to determine the best course of action. The 5 RS will provide qualified Crash Recovery personnel, tech data, and airframe specific crash recovery equipment, as required in the base support agreement. The 5 RS will provide quarterly aircraft familiarization/crash recovery training sessions for the 51 MXS/MXMTT.

1.9. For mishaps involving Republic of Korea or other non U.S. Air Force aircraft, 51 FW Installation Control Center (ICC) will notify the appropriate agencies of the aircraft mishap. If the IC determines recovery is beyond the scope of 51 FW's capabilities, due to lack of specific Mission Design Series (MDS) equipment or airframe expertise, he or she will notify the 51 FW Emergency Operations Center for coordination with the appropriate unit that has specific MDS expertise. This unit must ensure adequate personnel and support equipment are made available for recovery operations.

2. Declaration of Emergencies.

2.1. The aircrew is responsible for declaring ground or in-flight emergencies. Emergencies may also be declared by Air Traffic Control (ATC) personnel or officials responsible for the operation of the aircraft, e.g. Supervisor of Flying (SOF), 51 OG/CC, 731 AMS/CC, and mission director. The agencies listed above will not declare emergencies without concurrence of the aircrew, unless immediate action is required.

2.2. Individuals, other than those mentioned in paragraph 2.1., who become aware of aircraft emergency situations, will use any means available to relay the necessary information to any agency capable of initiating emergency procedures (Tower, SOF, Radar Approach Control, Fire Emergency Services, Installation Command Post, Airfield Management Operations (AM Ops), Maintenance Operation Control (MOC), etc.).

2.3. Persons declaring emergencies (ground or in-flight) should provide the following information:

2.3.1. Aircraft identification and type.

2.3.2. Nature of emergency.

2.3.3. Pilot's desires/intentions.

2.3.4. Aircraft altitude, position, and Estimated Time of Arrival (ETA) or location on airfield for ground emergencies.

2.3.5. Number of people on board.

2.3.6. Fuel remaining (in-flight emergencies only).

2.3.7. Number and type of ordnance on board. **Note**: Pass information available, including ordnance on board. Do not delay declaring the emergency.

2.4. Emergency information will be relayed to the Control Tower to activate the Primary Crash Alarm System (PCAS). If unable to contact the Tower, notify AM Ops, who will activate the Secondary Crash Net. AM Ops will in turn notify the Tower by landline.

3. Specific Responsibilities and Procedures.

3.1. 51st Operations Group Commander (51 OG/CC).

3.1.1. Is responsible to 51 FW/CC for all operational matters and decisions affecting handling of aircraft emergencies.

3.1.2. Directs the activation of Taxiway F Alternate Combat Runway (ACR), for aircraft emergencies when the situation dictates.

3.1.3. Works with the SOF or ATC facilities to obtain information or give directions.

3.2. 51st Mission Support Group Commander (51 MSG/CC):

3.2.1. Will provide an Emergency Operations Center (EOC) Director, who will be the liaison between the IC and the ICC. The EOC Director provides oversight for the Installation Commander to support and control emergency response to incidents.

3.2.2. Coordinates and controls all support activities based upon the operational situation and /or decisions by IC or 51 FW/CC.

3.3. Control Tower (51 OSS/OSAT):

3.3.1. Assists in operational decisions to engage barriers, designate landing runway for emergency aircraft, shutdown of aircraft engines, taxi aircraft clear of runway, aircraft diverts and other operational actions. Suspends runway operations after the emergency aircraft lands until a Foreign Object Damage (FOD) inspection can be conducted by AM Ops.

3.3.2. Monitors designated frequencies for aircraft emergency information whenever aircraft are operating.

3.3.3. Declares emergency for aircraft, when situation warrants.

3.3.4. Activates the PCAS whenever they receive information that would indicate an emergency is developing or in progress.

3.3.5. Obtains status of all airborne aircraft and advises them if the emergency is cause for divert or otherwise affects their flight.

3.3.6. Activates the PCAS when directed by SOF or 51 OG/CC to activate the ALS.

3.3.7. Provides priority handling for emergency aircraft as outlined in ATC directives, and uses emergency recovery frequency 121.5 or 243.0.

3.3.8. Provides approval for emergency responders to enter the Controlled Movement Area (CMA)/runway as required to follow/respond to the emergency aircraft.

3.3.9. Relays termination information to all concerned personnel and agencies when an emergency is terminated. Relays emergency termination for aircraft on the ground when the IC declares termination, and if the aircrew indicates no further assistance is required. Relays requests for further assistance to the IC.

3.3.10. Notifies AM Ops when the emergency is terminated.

3.4. 51 CES/CEF:

3.4.1. The Senior Fire Officer will establish the Incident Command System and act as the Incident Commander until the emergency is terminated and transitions to the recovery phase.

3.4.2. Positions Fire Emergency Services vehicles according to nature of emergency.

3.4.3. Provides fire protection or standby vehicle coverage until IC determines aircraft is safe.

3.4.4. In cases where the aircraft is stopped but engines are running, coordinates emergency activities with the aircrew until the aircraft is turned over to maintenance. **Note:** Use UHF Communications only with prior coordination from ATC and when critical.

3.4.5. Advises Tower when the emergency is terminated and Fire Emergency Services actions are complete.

3.4.6. Assumes responsibility for barrier maintenance functions when barrier maintenance crews are not on duty (Exception: only barrier maintenance crews are authorized to declare/certify barrier systems in service).

3.4.7. For emergencies involving barrier engagements, the IC will appoint the point man to rewind the barrier system.

3.4.8. Ensures hydrazine response, purge, and cleanup.

3.5. AM Ops (51 OSS/OSAM):

3.5.1. Relays information received from Primary Crash Alarm System via the Secondary Crash Net (SCN).

3.5.2. Responds to in-flight and ground emergencies that impact airfield operations.

3.5.3. Determines and informs Tower of airfield conditions and takes action to close or suspend runway or affected taxiway operations as deemed necessary.

3.5.4. Performs a visual inspection of the runway and affected taxiways for airfield damage or FOD, and requests airfield sweeper as necessary.

3.5.5. Ensures runway is clear of all vehicles, equipment and personnel. Advises the Tower and IC when runway operations can be resumed.

3.5.6. Secures activation/deactivation of ALS when required.

3.6. 51st Security Forces Squadron (51 SFS):

3.6.1. Responds to emergencies with sufficient personnel and vehicles to provide initial security for a crash site or damaged aircraft.

3.6.2. For in-flight emergencies, responds to appropriate taxiway intersections. Vehicles will remain short of the Foxtrot Taxiway unless instructed otherwise by Security Forces Control Center (SFCC) or the IC.

3.6.3. Follow directions given by IC to limit access, secure aircraft or crash site.

3.7. 51 MXS/MXMTT

3.7.1. The section supervisor will initiate a section recall determined by the type and scale of the emergency.

3.7.2. Dispatches CDDAR team to all aircraft related emergencies to remove aircraft from the active runway and taxiways. Transfers responsibility for aircraft marshaling to the aircraft flying unit maintenance personnel when released by the IC.

3.7.3. Instructs responding personnel to initially follow instructions of the IC until the aircraft is released to Crash Recovery maintenance supervisor.

3.7.4. Prepares personnel from the CDDAR team to marshal, chock, pin and prepare the aircraft for towing when an aircraft must be shut down on the runway or taxiway. Aircraft must be released by the IC to maintenance. **Note:** Aircraft must be safed by unit's de-arm crew prior to towing unless emergency circumstances dictate otherwise.

3.7.5. Coordinates with Maintenance Operations Center for the owning organization to provide a de-arm crew for all munitions on the aircraft.

3.8. 51st Medical Group (51 MDG):

3.8.1. Responds to a position (normally near Base Ops) as directed by the IC with an ambulance and personnel necessary to provide emergency medical care.

3.8.2. Remains at the scene until the emergency is terminated.

3.8.3. Situations involving aircrew/passenger physiological problems, a flight surgeon will meet the aircraft and ensure the affected personnel are examined once cleared by the IC. If a physiological problem is confirmed or suspected, notify owning organizational MOC or 51 MXG/QA.

3.8.4. Base Bio-Environmental Engineering (BEE) office will respond to the scene and perform health risk assessments, monitoring (if necessary) and advise the IC on health related issues i.e. hydrazine, composites, etc.

3.9. 51 CES/CEOFP:

3.9.1. For emergencies involving barrier engagements or possible barrier damage, responds to the affected barrier and is prepared to rewind or inspect for damage.

3.9.2. For in-flight emergencies (IFE) involving anticipated barrier engagements, respond to and prepare if necessary, the barrier most likely to be engaged (if known) or to a location on the airfield where immediate response can be made to any involved barrier.

3.9.3. Advises ATC of changes to barrier status.

3.10. 51 CES/CED:

3.10.1. Responds when requested by IC via the ICC and will be advised of incident location upon arrival to the entry control point (ECP). **Note:** 51 FWI 21-112, *End of Runway/ Explosives Loaded Aircraft, Hung Ordnance/Gun System Malfunction Procedures, and Hung Ordnance/Gun System Malfunction Impoundment*, when an incident involves hung/unsafe ordnance, Explosive Ordinance Disposal *(*EOD) personnel will remain on standby until weapons personnel requests EOD assistance through the IC.

3.11. 51 MXG/MOCC:

3.11.1. Assist with coordination of operations, guidance, and inter-agency assistance and communication for affected aircraft.

3.11.2. Implement emergency checklists as required.

3.11.3. Notifies all ground maintenance personnel of the emergency. Notifies appropriate unit's production superintendent to provide de-arm and tow crews.

3.12. 51 FW Safety Office (51 FW/SE):

3.12.1. Monitor, assess, and advise on response to aircraft emergencies.

3.13. Temporary Duty (TDY) Units:

3.13.1. Will respond to appropriate end of runway and safe aircraft when directed by IC.

3.13.2. Unit personnel responding to the emergency will switch to ramp net (if available) and prepare to assist the crash crew as required. If personnel do not have ramp net, they will standby until escorted to the scene by Crash Recovery/Transient Aircraft (TA) personnel. **Note:** It is each TDY Unit's responsibility to contact AM Ops immediately upon arrival at Osan Air Base to obtain required flight line drivers licenses and 51st Communications Squadron (51 CS) to have their radio's programmed for ramp net capability.

3.13.3. Will take possession of the aircraft, assume responsibility for further towing to parking spot and maintenance required after termination of emergency and removal from runway has been accomplished, unless there is a determination to initiate a mishap investigation.

3.14. 51 CES/CEOHP

3.14.1. Maintains and responds with heavy lifting equipment required to tow or push a crashed aircraft from the runway. Equipment is only required when directed by the IC to clear the runway by any means necessary.

4. Termination of Emergencies.

4.1. Aircrews may terminate emergencies of airborne aircraft.

4.2. When aircraft are on the ground, the emergency may only be terminated by the IC with concurrence of the aircraft commander.

4.3. Fire Emergency Services will notify the tower, who will in turn contact AM Ops to terminate the emergency over the secondary crash net.

5. Crash Recovery.

5.1. Crash recovery efforts are directed at returning the airfield to operational status after an aircraft mishap on, or in close proximity to, the runway.

5.2. Crash Recovery supervisor will be the ranking qualified Transient Alert person responding to the incident.

5.3. Crash Recovery supervisor, in coordination with the IC, will take appropriate action to clear the runway. The IC will determine the degree of urgency.

5.4. The Incident Commander will:

5.4.1. Maintain on-scene tactical control of all assets at the accident site.

5.4.2. Coordinate with 51 FW/SE before moving any damaged aircraft (time permitting).

5.4.3. Release wreckage to the Interim Safety Board President when initial crash recovery efforts are complete.

5.5. The 51 MXS Crash Recovery Supervisor will:

5.5.1. Be responsible to assist in recovery of all TDY and transient disabled aircraft, as outlined in AFI 21-101.

5.5.2. Conduct participate in annual training exercises.

5.5.3. Maintain crash recovery equipment in a serviceable condition, ready for immediate use.

5.5.4. Ensure crash recovery vehicles are manned. Proceed in a radio-equipped vehicle to the emergency staging area (Doorstop Ramp).

5.5.5. Upon notification of an on-base aircraft accident:

5.5.5.1. Assemble Crash Recovery crew and equipment at designated point and await instructions from IC.

5.5.5.2. Recall 51 MXS/MXMTT personnel in the event runway clearance is beyond the scope of the on-duty crash recovery crew.

5.5.6. Upon notification of an off-base accident, standby and await dispatch instructions from the IC and be prepared to initiate the crash recovery recall plan.

6. Aircraft Removal.

6.1. The following general procedures will apply for aircraft removal from the runway. In the event of a crash on the airfield, no part of the aircraft will be moved without concurrence of the Interim Safety Board President. Only the minimum essential personnel will respond to an aircraft incident. Observers not required in command/removal operations are not permitted.

6.2. Prior to starting removal operations on any aircraft:

6.2.1. The IC will release aircraft to appropriate Crash Recovery supervisor.

6.2.2. EOD personnel will render safe hung/damaged ordnance. EOD will stage outside the immediate recovery area and perform safing/downloading procedures when directed by the IC.

6.2.2.1. Under normal operating procedures, the Crash Recovery supervisor will coordinate with owning unit weapons crew to safe the aircraft prior to performing aircraft towing operations.

6.2.2.2. Crash Recovery technicians will disengage the barrier from the aircraft.

6.2.2.3. On an aircraft declaring hot brakes, Crash Recovery team will confirm the hot brake condition. If a hot brake condition exists, follow hot brake procedures. If

no hot brake condition exists, the aircraft will be released by the IC to taxi to the designated parking location.

6.2.2.4. Under emergency circumstances (must clear off active runway immediately) the Crash Recovery supervisor may tow the aircraft to the nearest taxiway prior to having the unit safe the aircraft. Consider safing ordnance, gun and other explosive hazards prior to all initial movement from crash position, to prevent initiation of explosive devices and forward firing munitions. If aircraft must be moved from the active runway prior to safing, the ordnance will be safed by EOD or the unit weapons crew after the emergency movement, but is dependent on condition of the ordnance.

6.2.2.5. Crash Recovery will tow aircraft off the runway and park at the nearest location, meaning Doorstop, EOR, or Base Operations Ramp. Crash Recovery will not tow aircraft back to original parking spot unless the IFE aircraft is the last aircraft down for local flying.

6.2.2.6. The IC will authorize emergency removal operations.

6.3. Applicable -2 and -3 maintenance manuals will be used for specific crash recovery procedures. If specific MDS maintenance manuals are not available locally, owning organizations will provide them, time permitting.

6.3.1. Recovery personnel will never approach burning/smoldering aircraft until completely extinguished and cleared to by the IC.

6.3.2. For aircraft containing composite materials, where there is the possibility of airborne particles, Crash Recovery members will wear full personal protective equipment (PPE) T.O. 00- 105E-9, *Aerospace Emergency Rescue and Mishap Response Information (Emergency Services)*.

6.4. If the crashed aircraft cannot be removed using a crane or lifting bags, and conditions warrant immediate runway clearance, the IC will direct all available equipment to be used to move the aircraft off the runway by any means possible. **Note:** Removal of Republic of Korea or other non U.S. Air Force aircraft, when further damage is probable, will be coordinated with the proper agency, time and circumstances permitting.

7. Crash, Damaged and Disabled Aircraft Recovery, Personnel and Equipment Requirements.

7.1. Minimum personnel required for specified CDDAR operations are outlined in T.O. 00-80C- 1, *Crashed, Damaged, Disabled Aircraft Recovery Manual,* T.O. 1A-10-2, *Maintenance Manual A-10 Aircraft,* T.O. 1A-10-3, *Structural Repair A-10 Aircraft,* T.O. 1F-16C-2, *Maintenance Manual F-16 Aircraft* and T.O. 1F-16C-3, *Structural Repair F-16 Aircraft*.

7.2. Transient Alert maintains general purpose crash recovery equipment, i.e., lifting bags, matting, landscaping equipment, crash trailer, response vehicles, etc. Transient Alert section maintains a detailed list of available CDDAR equipment, tools, vehicles and other supplies and consumables.

ANDREW P, HANSEN, Colonel, USAF
Commander

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

AFPD 21-1, *Maintenance of Military Materiel,* 29 October 2015

AFI 21-101, *Aircraft and Equipment Maintenance Management,* 21 May 2015

T.O. 00-105E-9, *Aerospace Emergency Rescue and Mishap Response Information,* 1 February 2006

T.O. 00-80C-1, *Crashed, Damaged Disabled Aircraft Recovery Manual,* 20 Mar 2015

T.O. 1F-16C-2, *Maintenance Manual F-16 Aircraft*

T.O. 1F-16C-3, *Structural Repair F-16 Aircraft*

T.O. 1A-10-2, *Maintenance Manual A-10 Aircraft*

T.O. 1A-10-3, *Structural Repair A-10 Aircraft*

51 FWI 21-112, *End of Runway/Explosives Loaded Aircraft, Hung Ordnance/Gun System Malfunction Procedures, and Hung Ordnance/Gun System Malfunction Impoundment,* 31 August 2015

Abbreviations and Acronyms

AB—Air Base

ACR—Alternate Combat Runway

AFRIMS—Air Force Records Information Management System

RDS—Records Disposition Schedule

ALS—*Alternate Landing Surface*

AM—*Airfield Management*

AMC—*Air Mobility Command*

AMOPS—*Airfield Management Operations*

AMS—*Air Mobility Squadron*

ATC—*Air Traffic Control*

BEE—*Base Bio-Environmental*

CDDAR—*Crash Damaged or Disabled Aircraft Recovery*

CES—*Civil Engineering Squadron*

CMA—*Controlled Movement Area*

CS—*Communications Squadron*

DO—Director of Operations

ECP—entry control point

EOC—*Emergency Operations Center*

EOD—*Explosive Ordinance Disposal*

ETA—*Estimated Time of Arrival*

FOD—*Foreign Object Damage*

IC—*Incident Commander*

ICC—*Installation Control Center*

IFE—*In-Flight Emergency*

MDG—*Medical Group*

MDS—*Mission design Series*

MOC—*Maintenance Operation Control*

MXG—*Maintenance Group*

MXS—*Maintenance Squadron*

OPR—Office of Primary Responsibility

PCAS—*Primary Crash Alarm System*

PPE—*Personal Protective Equipment*

QA—*Quality Assurance*

SCN—*Secondary Crash Net*

SE—*Safety Office*

SFCC—*Security Forces Control Center*

SFO—*Senior Fire Officer*

SFS—*Security Forces Squadron*

SOF—*Supervisor of Flying*

TA—*Transient Aircraft*

TDY—*Temporary Duty*

UHF—*Ultra High Frequency*